

Release of Updated Curriculum Standard Heavy Equipment Operator (HEO) Trades	
Trade Names & Codes	Heavy Equipment Operator – Tractor Loader Backhoe (636A) Heavy Equipment Operator – Excavator (636B) Heavy Equipment Operator – Dozer (636C)
Implementation Date of New Curriculum Standard	Tuesday September 5 th , 2023 released as Version 300
Implementation Plan	<ul style="list-style-type: none"> • Apprentices who began their apprenticeship on the former 2002 Schedules of Training can complete their program using the learning outcomes in that standard. • All apprentices with initial training agreements registered on or after September 5th, 2023 must be trained to this new curriculum. • This new Curriculum Standard includes 15 reportable subjects totalling 300 hours of in-school hours (in comparison to the previous 5 reportable subjects totalling 240 hours) • The 15 new reportable subjects have been mapped to the original 5 reportable subjects (this mapping can be found in the Supplemental Resource Guide for this New Curriculum Standard) • Of the 15 new reportable subjects, 12 are common core across the 3 Heavy Equipment Operator Trades and 3 are non-common core/unique to each Trade – individuals who participate in more than 1 of the HEO apprenticeship programs, only need to complete the non-common core reportable subjects if they have already completed the 12 common core reportable subjects • The pre-requisite requirements are listed in both the Curriculum Standard and the Supplemental Resource Guide for reference. •
Impact on Training Standards	<ul style="list-style-type: none"> • The previous 2002 Schedules of Training for the 3 Heavy Equipment Operator trades are being eliminated, including the original skill sets and skills that were encompassed in those combined documents. • With the implementation of this new curriculum for these 3 trades, the new documents will have a distinct curriculum separate from the on the job standards. • Three separate, unique and expanded Apprenticeship Training Standards (1 for each of the 3 HEO trades) have also been completed and will be implemented in advance of the Curriculum Standard. • The 3 x Training Standards will be released at the same time. The Curriculum Standard will follow on the following date September 5th, 2023 to provide time for Training Delivery Agencies to update their programs.

Curriculum Standard Access	<p>As September 5th, 2023</p> <ul style="list-style-type: none"> • The new Curriculum Standard will be available on the Skilled Trades Ontario website. • Training Delivery Agents (TDAs) can download/print a copy from the Skilled Trades Ontario website. • The new supporting Supplemental Resource Guide for this new Curriculum is also available on Skilled Trades Ontario for downloading/printing.
Structural Changes, Content Additions, Enhancements and Changes	<p>The new Curriculum Standard for the 3 Heavy Equipment Operator (HEO) trades represents a complete overhaul in comparison to the previous learning outcomes set out in the 2002 Schedules of Training. The new Curriculum Standard has also been enhanced significantly to include critical content that was missing from the 2002 Schedules of Training and has been fully harmonized with the updated Red Seal Standards (Interprovincial Guides and National Occupational Analyses).</p> <p>This new Curriculum Standard is structured in a reportable subject model and encompasses common and non-common core reportable subjects for all 3 HEO trades. It includes a total of 15 reportable subjects (12 common core for all 3 trades and 3 unique reportable subjects for each of the 3 trades) and is fully updated and harmonized with all 6 Red Seal standards for these 3 trades. This new Curriculum Standard represents an immense growth and expansion from the previous learning outcomes reflected in the outdated 2002 Schedules of Training, where there were only 5 reportable subjects.</p> <p><u>General Comments about the Curriculum Overhaul:</u></p> <ul style="list-style-type: none"> • The Schedules of Training were last updated in 2002 and were no longer reflective of industry needs, were not harmonized with the new Red Seal standards released in 2016 and were missing significant outcomes in the original documents. All of the changes reflect the evolution of the trade and industry’s needs and harmonization with Red Seal. In addition, the transition from schedules of training to full curricula documents is also reflected in the changes. • The Red Seal Interprovincial Guides and National Occupational Analyses for the three HEO trades were released in 2016. Ontario implemented the Red Seal endorsements for the three HEO trades as of February 27, 2017. The new document is completely aligned to meet and exceed Red Seal standards. • The new Curriculum Standard includes a Supplemental Resource Guide to support implementation. This HEO Curriculum Supplemental Resource Guide includes the following: <ul style="list-style-type: none"> ○ Apprenticeship Pathway to a Certificate of Qualification ○ Program Summary: Reportable Subjects & Recommended Hours ○ Program Summary: Pre-requisites and Co-requisites ○ Equipment, Materials and Site Recommendations ○ Reportable Subject Mapping 2002 Learning Outcomes (Schedules of Training) to new Curriculum Standard

- Evaluation Structure Breakdown
- Common vs Non-common core hours
- Hours Comparison 2002 Schedules of Training to New Curriculum

- **The new Curriculum includes enhanced recommendations related to equipment, material and site requirements for Training Delivery Agents (TDAs).** This information was previously not included in the 2002 Schedules of Training as they were not full curriculum documents. The recommendations reinforce the importance of equipment seat time to ensure knowledge and skill transfer. These recommendations are by trade and include recommendations for the following; Equipment; Attachments, Tools, Materials and Site Requirements.

Details of the Curriculum Standard Overhaul:

This Curricula Standard overhaul includes 15 Reportable subjects for each trade (in comparison to 5 reportable subjects for each trade in the original 2002 Schedules of Training), thereby tripling the number of units/subjects that need to be completed by Apprentices in these trades.

2002 Reportable Subjects

1. Introduction and Safety
2. Pre-operation inspection
3. General Preventative Maintenance
4. Operate Tractor Loader Backhoe/Excavator/Dozer
5. Transporting Equipment

New Reportable Subjects:

1. **3270.0 Trade Documents**
2. **3271.0 Safety and Trade Practices**
3. **3272.0 Communications**
4. **3273.0 Introduction to the Equipment**
5. **3274.0 Troubleshooting and Repairs**
6. **3282.0 Maintenance and Pre-Operations (Tractor Loader Backhoe)**
- 3285.0 Maintenance and Pre-Operations (Excavator)**
- 3288.0 Maintenance and Pre-Operations (Dozer)**
7. **3283.0 Operations (Tractor Loader Backhoe)**
- 3286.0 Operations (Excavator)**
- 3289.0 Operations (Dozer)**
8. **3275.0 Post-Operations**
9. **3284.0 Attachments and Implements (Tractor Loader Backhoe)**

- 3287.0 Attachments and Implements (Excavator)
- 3290.0 Attachments and Implements (Dozer)
- 10. 3276.0 Environmental Protection
- 11. 3277.0 Soil Fundamentals
- 12. 3278.0 Surveys and Grades
- 13. 3279.0 Hoisting and Rigging
- 14. 3280.0 Industry sectors - Specialized Work
- 15. 3281.0 Transportation

The new Reportable subjects directly reflect the content outlined in the Red Seal Interprovincial Guides (IPGs) that were updated in 2016 and provide a more concrete and holistic learning foundation that supports the blocks, tasks and sub-tasks in the Red Seal National Occupational Analyses, upon which the Certificate of Qualification examinations are based.

List of the Red Seal Instructional Units for the 3 Heavy Equipment Operator Trades:

2016 Red Seal Units	Was this Unit covered in the 2002 Provincial Schedules of Training?	Is this Unit covered in the New Curriculum Standard?
Safety	yes	yes
Tools and Equipment	no	yes
Hoisting and Rigging	Not as a distinct unit	yes
Communications	Not as a distinct unit	yes
Survey Indicators - I	no	yes
Slopes and Grades	no	yes
Methods of Approach	no	yes
Trade Related Documents	no	yes
Soil Fundamentals	no	yes
Introduction to Heavy Equipment	no	yes
Heavy Equipment Systems and Components	no	yes

	Scheduled and Preventative Maintenance	yes	yes
	Pre and Post Operational Inspections	Only pre-inspection	yes
	Troubleshoot and Basic Repairs	Not really	yes
	Attachments and Implements - I	Not as a distinct unit Not all operations were included	yes
	Transportation of Equipment	yes	yes
	Equipment Operation Safety	no	yes
	Environmental Protection - I	no	yes
	Excavators/Dozers/Tractor Loader Backhoe – I (<i>common operations</i>)	Yes, but not all operations were covered	yes
	Survey Indicators - II	no	yes
	Drawings and Plans	no	yes
	Attachments and Implements – II (<i>specialized attachments</i>)	no	yes
	Environmental Protection - II	no	yes
	Excavators/Dozers/Tractor Loader Backhoe – II (<i>specialized operations</i>)	no	yes

The chart below illustrates the evolution and progression of the existing 2002 Schedules of Training to the new Curriculum Standard and compares them against the Red Seal outcomes. It demonstrates the significant gaps in the original 2002 documents with only 5 reportable subjects and the overhaul needed to align the new documents with the Red Seal standards released in 2016:

Original 2002 Provincial Schedules of Training Reportable Subjects	Red Seal Learning outcomes (Interprovincial guides) 2016	Draft 2017 Provincial Curriculum Reportable Subjects	Notes
<i>No reportable subject at that time</i>	Trade related Documents (L1)	Trade Documents	Common core
Introduction and Safety	Safety (L1) Introduction to Heavy Equipment (L1)	Safety and Trade Practices	Common core
<i>No reportable subject at that time</i>	Communication (L1)	Communications	Common core
<i>No reportable subject at that time</i>	Heavy Equipment Systems and Components (L1)	Introduction to the Equipment	Common core
<i>No reportable subject at that time</i>	Troubleshooting and Basic Repairs (Dozer) (L1) Troubleshooting and Basic Repairs (Excavator) (L1) Troubleshooting and Basic Repairs (TLB) (L1)	Troubleshooting and Basic Repairs	Common core
Pre-operation inspection And General Preventative Maintenance	Scheduled and Preventative Maintenance (Dozer) (L1) Scheduled and Preventative Maintenance (Excavator) (L1) Scheduled and Preventative Maintenance (TLB) (L1) Pre and Post Operational Inspections (L1)	Maintenance and Pre-operations – TLB Maintenance and Pre-operations – Excavator Maintenance and Pre-operations - Dozer	Not common core

	Operate TLB Operate Excavator Operate Dozer	Methods of Approach (L1) Equipment Operation Safety (L1) Excavator I (L1) Dozer I (L1) TLB I (L1) Excavator II (L2) Dozer II (L2) TLB II (L2)	Operations – TLB Operations – Excavator Operations - Dozer	Not common core
	<i>No reportable subject at that time</i>	Pre and Post Operational Inspections (L1)	Post-Operations	Common core
	<i>No reportable subject at that time</i>	Attachments and Implements I (Dozer) (L1) Attachments and Implements I (Excavator) (L1) Attachments and Implements I (TLB) (L1)	Attachments and Implements – TLB Attachments and Implements – Excavator Attachments and Implements – Dozer	Not common core
	<i>No reportable subject at that time</i>	Environmental Protection (L2)	Environmental Protection	Common core
	<i>No reportable subject at that time</i>	Soil Fundamentals (L1)	Soil Fundamentals	Common core
	<i>No reportable subject at that time</i>	Survey Indicators I (L1) Slopes and Grades (L1) Survey Indicators II (L2) Drawings and Plans (L2)	Survey and Grades	Common core
	<i>No reportable subject at that time</i>	Hoisting and Rigging (L1)	Hoisting and Rigging	Common core
	<i>No reportable subject at that time</i>	Attachments and Implements I (Dozer) (L2) Attachments and Implements I (Excavator) (L2) Attachments and Implements I (TLB) (L2)	Industry Sectors	Common core
	Transporting Equipment	Transportation of Equipment	Transportation	Common core

Content Changes and Additions Continued—Details

Highlights of the content changes/additions within the 15 New Reportable Subjects:

Content changes are immense. Almost every reportable subject and all existing learning outcomes were completely overhauled in the new standard. For example:

- The new **Trade Documents (3270)** reportable subject becomes the foundation for all reportable subjects in the document – it is a pre-requisite for all courses and reflects knowledge related to 5 key documents; OHS, Operator’s manual, Safety Bulletins, Employer and Site-specific procedures, Reporting documentation
- The updated and enhanced **Safety and Trade Practices (3271)** reportable subject establishes learning outcomes and objectives in relation to 7 key areas of safety critical for the operator; Fire safety, Personal Safety, Safety Devices (Equipment), Hazards in the workplace/creating safe work environments, Ground stability, Machine stability, Safe Limits of Approach.
- The new **Communications (3272)** reportable subject was separated from the safety reportable subject because of the criticality of communication and signalling for the HEO trades/sector. The new reportable subject is divided into two key learning outcomes; Signalling and Communication Techniques
- The new **Introduction to the Equipment (3273)** reportable subject was added for two key reasons; a) the 2002 documents completed missed these outcomes b) harmonization with Red Seal (this is a critical unit in the Red Seal Interprovincial Guides). This reportable subject reflects an important introduction for the apprentice to equipment components, equipment systems, machine specifications, dimensions and load charts.
- The new **Troubleshoot and repairs (3274)** reportable subject also reflects critical outcomes missing from the 2002 documents which only spoke to preventative maintenance. This new subject represents the important distinction between troubleshooting and repairs versus preventative maintenance. This is important for operators who must understand the distinction between minor vs major repairs and their role in troubleshooting the equipment. This new subject directly also reflects outcomes in the 2016 Red Seal IPGs.
- The updated and enhanced **Maintenance and Pre-operations (3282, 3285, 3288)** reportable subjects realistically reflect the creation of new reportable subjects with the enhancement of some outcomes that existed in the old General Preventative Maintenance reportable subject. First and foremost, these new subjects are no longer common core. Second, the addition of the pre-operation outcomes to these reportable subjects are part of the rationale as to why these subjects are no longer common core. The checklist is a critical part of the operator’s role.
- The enhancement and updating of the three **Operations (3283, 3286, 3289)** reportable subjects which remain non-common core as they were in the 2002 documents, reflect the reality of how the Training Delivery Agencies were running this portion of the program. The outcomes are directly harmonized with the

related Red Seal outcomes including; types of operations for each machine, positioning requirements, practical outcomes related to performing each operation and use of Global Position Systems (GPS) systems. The practical outcomes are the most significant part of these enhanced reportable subjects.

- The new **Post-operations (3275)** reportable subject reflects the post operation inspection, maintenance and storage requirements in learning outcome format. The post operation maintenance and inspection were previously not reflected in the 2002 documents. Storage was previously reflected in transportation but its direct link to inspection and maintenance justifies its location in this new reportable subject.
- The new **Attachments and Implements (3284, 3287, 3290)** reportable subjects (non-common core) reflect critical missing elements from the 2002 documents. This void was even more significant as the Red Seal IPGs actually reflects two levels of reportable subjects to this topic. Standard attachments are included in this reportable subject while specialized attachments and work is included in the industry sectors-specialized work reportable subject. Critical practical outcomes related to the installation and removal of these attachments and implements are part of these new reportable subjects. It was important for these subjects to be non-common core as attachments are significantly different between the three machines (especially dozer vs excavator & TLB). The outcomes are also reflective of new technologies not included in the 2002 documents i.e. quick attach
- The new **Environmental Protection (3276)** reportable subject reflects a critical oversight by the drafters of the 2002 documents, reflects harmonization with Red Seal as well as changes in legislation to protect the environment. The learning outcomes introduce the apprentice to terminology and authorities, environmental hazards and causes of environmental harms, spill prevention/control and cleanup, soil stabilization, sediment control
- The new **Soil Fundamentals (3277)** reportable subject also reflects a critical oversight by the drafters of the 2002 documents and reflects harmonization with Red Seal. The subject introduces the apprentice to soil types and applications, aggregate types characteristics and classifications, swell and compaction
- The new **Surveys and Grades (3278)** reportable subject integrates critical concepts and outcomes related to grades, slopes, elevations, surveying, survey indicators and survey equipment into one critical reportable subject that is harmonized with the Red Seal outcomes.
- The new **Hoisting and Rigging (3279)** reportable subject takes the topic from the old Safety and Introduction reportable subject into a separate course/unit.
- The new **Industry sectors – specialized work (3280)** reportable subject directly reflects the outcomes and objectives in the level 2 Red Seal attachments and implements course by speaking to specialized attachments. In addition, it introduces the apprentice to specialized industries and operations for operators like forestry and mining.

- The updated and enhanced **Transportation (3281)** reportable subject has been defined more clearly to reflect 9hours (instead of 81 hours) and focuses on loading, unloading equipment, attachments and implements as well as road driving procedures.

Hour Changes – increase from 240 hours to 300 hours

Hours Increase Summary:

The previous 2002 Schedules of training allocated 240 hours for in-school learning for each of the three trades.

With the expansion of the reportable subjects and learning outcomes to harmonize with Red Seal, to fill the gaps related to significant missing outcomes in the 2002 documents and to meet technological, environmental and other changes, the **new Curriculum Standard is based on an expanded 300 hours in school for each of the three trades.**

As mentioned above, the new Curriculum Standard includes 15 reportable subjects per trade. **This constitutes a tripling of the learning content units.** these reportable subjects, 12 are common core subjects and 3 non-common core subjects/unique to each trade. The common core hours total 129 hours and the non-common core hours total 171 hours per trade.

Number	Reportable Subjects	Hours Total	Hours Theory	Hours Practical
3270	Trade Documents	16	8	8
3271	Safety and trade practices	17	14	3
3272	Communications	4	4	0
3273	Introduction to the equipment	9	7	2
3274	Troubleshooting and repairs	8	6	2
3282 - TLB	Maintenance and pre-operations*	4	2	2
3285 - Excavator				
3288 - Dozer				
3283 - TLB	Operations*	162	6	156
3286 - Excavator				
3289 - Dozer				
3275	Post-operations	22	2	20
3284 - TLB	Attachments and implements*	5	2	3
3287 - Excavator				
3290 - Dozer				

3276	Environmental protection	4	4	0
3277	Soil fundamentals	8	4	4
3278	Surveys and grades	8	5	3
3279	Hoisting and rigging	16	6	10
3280	Industry sectors (specialized work)	8	7	1
3281	Transportation	9	3	6
	Total	300	80	220

Note: The previous versions of the 2002 documents for these trades included 240 hours per trade with 78 hours being common core and 162 being non common core. There were only 5 reportable subjects in the 2002 editions including Introduction and safety (common core), Pre-operation and inspection (common core), General preventative maintenance (common core); Operate (TLB, Dozer, Excavator) (non-common core) and Transportation (non-common core).

Key rationales and justifications for the increase in in-school hours includes:

- New Curriculum represents a transition from schedule of training formats to full curriculum standards
- Tripling of the number of reportable subjects: 15 reportable subjects (12 common core and 3 non-common core) increased from the original 5 reportable subjects
- Fully harmonized with the Red Seal standards (interprovincial guides and national occupational analyses) for the HEO trades – the new curriculum meets and exceeds the minimum standards and requirements set out in the Red Seal documents
- 11 new and separate reportable subjects to reflect either missing or enhanced concepts/material
 - Trade Documents
 - Communications
 - Introduction to the Equipment
 - Troubleshooting and Basic Repairs
 - Post Operations
 - Attachments and Implements

- Environmental Protection
- Soil Fundamentals
- Survey and Grades
- Hoisting and rigging
- Industry sectors – Specialized work
- The additional reportable subjects and content directly reflect required content needed for knowledge transfer to the apprentices
- New content reflects updated trade terminology that coincides with the Red Seal Standards for all 3 HEO trades
- The hours’ allocations for the revised and enhanced reportable subjects directly reflect how the units should be run by the Training Delivery agent. The previous allotment was not reflective of practices and needs.
- New content reflects new equipment technologies and operations i.e. specialized attachments and quick attach are reflected in new reportable subjects including; Attachments and Implements and Industry Sectors-Specialized Work as well as GPS systems, tier 4 emission systems
 - Tier 4 Emission Systems and Standards:
 - Emission standards are the legal requirements governing air pollutants released into the atmosphere. Emission standards set quantitative limits on the permissible amount of specific air pollutants that may be released from specific sources over specific timeframes.
 - The goal of Tier 4 emission standards in the heavy equipment operation sector is to reduce emissions from non-road diesel engines by integrating engine and fuel controls as a system to gain the greatest emission reductions.
 - The Tier 4 standards require significant emission reductions of particulate matter (pm) and nitrogen oxides (nox). Such emission reductions can be achieved through the use of control technologies
 - New Equipment Technologies – quick attach and specialized attachments:
 - The advent of new technology in terms of attachments and specialized work has increased the scale and capacity of heavy equipment operators work and has made that work more effective and efficient.
 - Quick-attach technology allows for rapid changes in attachments (such as buckets) on the machine. They remove the need for operators to use hammers to manually drive out and insert mounting pins for attachments. However, they may also bring with them additional safety and operational risks. Fatalities have occurred as a result of improper training including but not limited to buckets being accidentally released from work equipment during operation. Released attachments such as buckets have also hit bystanders and caused injuries and even fatalities. As a result, the

integration of learning outcomes related to attachments and implements and specifically regarding specialized attachments and implements reflects the evolution of the industry for heavy equipment. These learning outcomes will support the capacity of the operator to properly use an

- Furthermore, manufacturers continue to design new attachment/implement technology to decrease tool inefficiency. In heavy equipment, the desire for efficiency in task completion has resulted in innovation in technology.
 - GPS and Telematics:
 - Technological innovation has led to the adoption of GPS /Telematic technology in heavy equipment. Telematic systems keep track of components and different machinery elements and is slowly becoming a staple amongst businesses for heavy machinery fleets. It offers industry the capacity to track and use data for efficiency, effectiveness and potential cost savings. GPS and other monitoring systems gather data that allows industry to track vehicles and work. Telematics systems combine GPS technology, on-board diagnostics and monitoring sensors to track, log and report data via cellular networks on the performance and operation of your construction equipment. Common data points include GPS location, fuel consumption, idle times and machine alerts. Benefits may include:
 - Asset Allocation
 - Maintenance & Repair Schedules
 - Operator Performance
 - Reduce theft
 - Reduce fuel consumption
 - More accurate job estimates
 - Manage operating expenses
 - Improve productivity
 - As a result, the addition of learning outcomes to reflect operator knowledge transfer related to the operation of, use of and potential repair of these technologies is critical.
- New content reflects enhanced safety and environmental concerns that need to be addressed in knowledge transfer are reflected in new reportable subjects including; Trade Documents, Communications, Soil Fundamentals, Environmental Protection
 - The New trade documents course is the first and foundational course for all HEO apprentices focusing navigating and using the OHSA, Operator’s manual, safety bulletins, site policies and procedures and reporting documentation

	<ul style="list-style-type: none"> ○ The Enhanced safety and trade practices course has been expanded to include specific learning outcomes on fire safety, personal safety, safety devices, hazards in the workplace, creating safe work environments, ground stability, machine stability, safe limits of approach ● Ontario was an important model for the enhancements to the Red Seal endorsement programs for all 3 HEO trades – by not implementing the updated provincial curriculum that is harmonized with the Red Seal programs, Ontario is rejecting the content and endorsements that it led at the interprovincial level ● New content reflects enhanced practical learning outcomes in the curriculum (because of the nature of the trades – as operator trades – these outcomes are critical, even in a controlled learning setting) - to complete practical learning outcomes requires additional time during the in-school training
<p>General Notes & Rationale</p>	<p><u>Inspiration and Impetus for the HEO Trades’ Curriculum Standard Overhaul:</u></p> <ul style="list-style-type: none"> ● Extreme age of the existing Ontario documents (2002) ● The restructuring of all the Red Seal programs for the HEO trades ● Ontario’s leadership and support in reviewing, overhauling and updating all the 6 Red Seal products and 9 Red Seal examinations to reflect the new interprovincial structures ● Ontario’s adoption of the Red Seal endorsement for each of the 3 HEO trades ● Original 2002 Schedules of Training document structures were extremely limiting – there was a critical need for a full Curriculum Standard and 3 unique and independent Training Standards to reflect the broad array of learning outcomes and performance objectives for these trades, particularly since they are competency-based trades. ● Significant content gaps in the existing 2002 Schedules of Training, which were not reflective of both the learning needs in 2002 and now as well as not reflective of content in the updated Red Seal standards ● Critical content gaps related to the environment, health and safety, tools and instruments, soil conditions, equipment operations, attachments and implements

Additional reportable subjects and learning outcomes were necessary to:

- Ensure harmonization with Red Seal standards
- Meet and exceed the minimum standards set out in the Red Seal documents
- Ensure knowledge transfer for important outcomes that were completely missing from the 2002 documents including;
 - introduction to the equipment (cognitive outcomes related to understanding the systems and components),
 - troubleshooting and basic repairs (particularly in regards to the role of the operator and understanding concepts of minor vs major repair),
 - attachments and implements (particularly because the types and functions of attachments and implements is continually growing especially for the excavator and TLB),
 - environmental protection (particularly in relation to spills and sedimentation control – role of environmental factors in work is becoming critical in greening the construction trades),
 - soil fundamentals (there were no previous outcomes related to soil and aggregate types, swell and compaction factors which are critical in work being performed by HEOs)
 - industry sectors/specialized work (specialized attachments and implements are covered in the Red Seal program in a level 2 course – Ontario had no previous course or outcomes related to specialized work and industries).
- Update trade terminology to coincide with the National Occupational Standards Analyses (NOAs) and Interprovincial Guides (IPGs)
- Model Ontario’s programs as the standard for the rest of the jurisdictions (Ontario has taken somewhat of a lead in the development and implementation of the new Red Seal endorsements)
- Expand on trade knowledge to increase apprentice competency and completion rates and ensure apprentice, public and environmental safety and security
- Ensure that achievement of the expanded practical learning outcomes (psychomotor domain) - Because of the nature of the 3 HEO trades, there are significant practical outcomes that have been integrated into the new curricula in many of the reportable subjects
- Pre-requisite and co-requisite requirements were established to ensure the transfer of knowledge is based on foundational theory that all apprentices have before they move on to the next course. The new document includes a program summary chart with pre and co-requisites.
- The new standard establishes clear directions for TDAs related to both theory and practical outcomes

Transition from Schedules of Training to Full Curriculum Standard:

- The products for each of the three Heavy Equipment Operator trades (636A, 636B and 636C) have transitioned from the Schedule of Training models to a combined Curriculum Standard with both common and non-common core reportable subjects
- Skill sets and skills have been removed and are included in 3 new distinct Apprenticeship Training Standard documents – one for each of the 3 HEO trades

Other Additions:

- Development of a **Supplemental Resource Guide** to support curriculum implementation including:
 - Apprenticeship Pathway to a Certificate of Qualification
 - Program Summary: Reportable Subjects & Recommended Hours
 - Program Summary: Pre-requisites and Co-requisites
 - Equipment, Materials and Site Recommendations
 - Reportable Subject Mapping 2002 Learning Outcomes (Schedules of Training) to new Curriculum Standard
 - Evaluation Structure Breakdown
 - Common vs Non-common core hours
 - Hours Comparison 2002 Schedules of Training to New Curriculum
- The **Equipment, Materials and Site Recommendations** in the new Supplemental Resource guide were a critical recommendation from the working group to ensure that the learning environment was structured in a way that supported knowledge transfer. This specifically includes; recommendations for ratios of number of students to pieces of equipment for practical outcomes to ensure all students can achieve learning outcomes, equipment/tool/material list recommendations and site recommendations
- **Evaluation structure parameters** for each reportable subject was updated in the new Curriculum Standard

New Curriculum Mapping

- The new Curriculum Standard for the HEO Trades has been fully mapped to the old learning outcomes in the 2002 Schedules of Training. This information is located in the Supplemental Resource Guide.
- Apprentices registered prior to the implementation date will only have to complete the mapped elements from the old programs. In addition, because the new curriculum is set up by reportable subjects, the 2 TDAs will not have to run separate programs in the transition.

Skilled Trades Ontario – HEO Trade Board Approval:

The enhanced curriculum was approved by the HEO Trade Board on August 28, 2017